

**Self-Seeded Single-Frequency Solid-State Ring Laser, and Single-Frequency Laser
Peening Method and System Using Same**

ABSTRACT

5 [0077] A method of operating a laser to obtain an output pulse having a single
wavelength, comprises inducing an intracavity loss into a laser resonator having an
amount that prevents oscillation during a time that energy from the pump source is being
stored in the gain medium. Gain is built up in the gain medium with energy from the
10 pump source until formation of a single-frequency relaxation oscillation pulse in the
resonator. Upon detection of the onset of the relaxation oscillation pulse, the intracavity
loss is reduced, such as by Q-switching, so that the built-up gain stored in the gain
medium is output from the resonator in the form of an output pulse at a single frequency.
An electronically controllable output coupler is controlled to affect output pulse
15 characteristics. The laser acts a master oscillator in a master oscillator power amplifier
configuration. The laser is used for laser peening.